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Social television of new media

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This study discusses online audiovisual database, a cloud-based application that is capable of live video streaming, video-on-demand services, live playlists, and video hosting. The study also focuses on new media application users and how to maintain technological synergy, and standard protocol. The internet is generative by nature. As a result, internet video repositories enhance the distribution of video contents through broadband affinity and internet facility.

The methods used in this study are user feedback and questionnaire. The purpose was to gather information on synchronization of digital generative with interactive processes to create a new media of social online television. The ubiquity of online services has shifted attention from traditional television broadcasting to online video broadcasting and hosting, which can be viewed on multiple devices, such as desktop computers, mobile devices, and televisions.

As a result of this study, the development of mobile technology and other forms of internet connected screen technology solution is utilized to exhibit this new media as easily accessible innovation that makes television experience attractive. There is possibility to connect anywhere, this innovation has paved way for internet video repositories and its unique delight to the society with wide range of capacity, ease of exploration, diverse tasks adaptation and global accessibility with the possibility to recast its scope of uses in real time and also supports the culture of social interaction.

Keywords	Social Media, New Media, Traditional Television Channel, Internet protocol, Broadcast, Artificial Intelligence, Hashtagging.

Contents

1 Introduction

This thesis explores a new media ideology of utilizing social media concept in creating internet video repositories which will combine video on demand services with live streaming capability.

Social technology has made a breakthrough with a creative twist. Also, social media streaming has become more accessible because mobile devices make it easier to spend more time online. Moreover, social media has the ability to influence and reshape societies. It is used for many reasons such as connecting with friends and family, or for entertainment purposes or marketing. [1.]

This thesis is divided into three sections. Chapters 2 and 3 discuss Internet video database with an attribute of social media which can be referred to as social television of new media. Chapters 4 to 6 focus on digital video hosting, technological synergy and mode of delivery of the television broadcast. Chapter 7 to 10 is about Television transmission technology, social media television distribution, challenges, and bandwidth plan for Africa. Conclusions can be found in Chapter 11, while the abstract and summary state the concept and the overview of the project. Appendices present the research tools used in the process of this thesis.

To gather information a live musical concert was organized, and the video was recorded and streamed live on three different types of social media. Study also included designing of different framework to engage and gather participant's thoughts in another home studio recorded event. Figure 1 shows the workflow of tvRay Africa, a social television start-up page on Facebook adapted for the purpose of the thesis research, the stage of the workflow starts from the script to recording tools used, the mixing application and the internet protocol used.

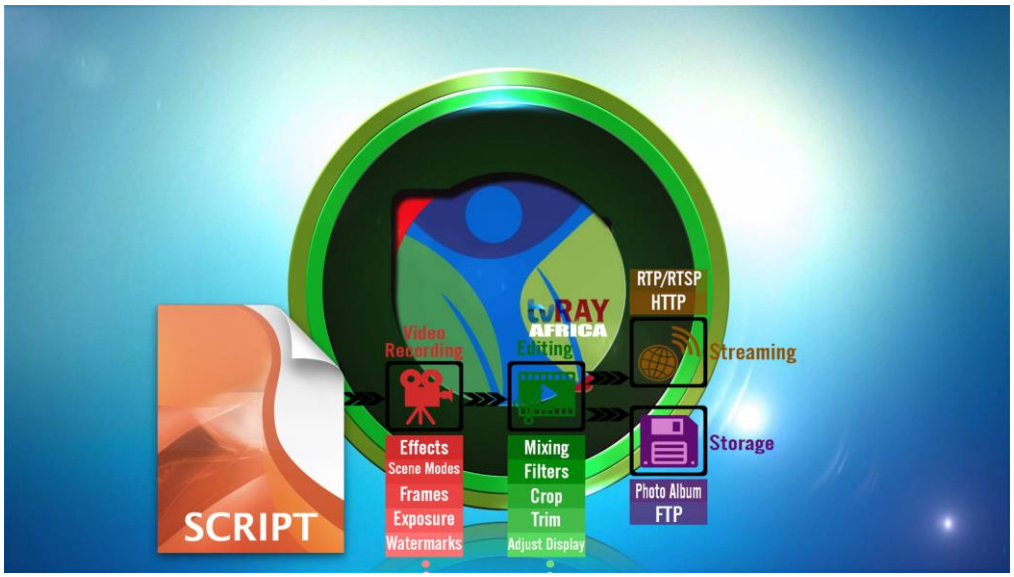

Figure 1. tvRay Africa workflow from http://bit.ly/2zuUWL9.

1.1 History of Social Media

Friends and family interacting with each other over long distances have been one of the major concern of humans over the centuries. [1.] Though it appears as if social media is a new trend, for example Facebook is a bi-products of multiple centuries of development of social media. [1.]

Home computers were becoming more sophisticated and common by 1980s. In 1988, internet relay chats (IRCs) were used, the popularity continues through 1990's. Social media started to gain popularity after blogging was invented, which witness the birth of social media platforms such as LinkedIn and Myspace in the early 2000s gain eminence, alongside Photobucket and Flickr which are the facilitators of online photo sharing. In 2005, YouTube started a new way of communication across great distance. [1.]

The year 2006 witnessed the birth of Facebook and Twitter which are more accessible for people across the globe, these social media platforms are the most used social networks now on the web. Other social media platforms include Tumblr, Spotify, Foursquare and Pinterest with each serving a particular purpose. [1.]

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2 Social Television of New Media

This study discusses new media technology that is capable of engaging users through combination of diverse social media service techniques including digital generative and interactive processes. The services can be made available via internet and a dedicate database.

Until recently, television broadcasting across the globe has been a business of the wealthy, this stated fact is also unique to film makers and other forms of media content creators. The price tag placed on traditional television broadcasting has made media broadcasting a risky business to a willing investor because of the uncertainty of generation of require incomes from the media consumption of the products especially if there is a limited or lack of financial support, after a lot of investment has gone into the broadcast production.

It is possible for any broadcasting via online services to be ubiquitous, such as social media platforms like Facebook, YouTube, Twitter and Instagram. Figure 2 is an example diagram of solutions which social media television can offer.

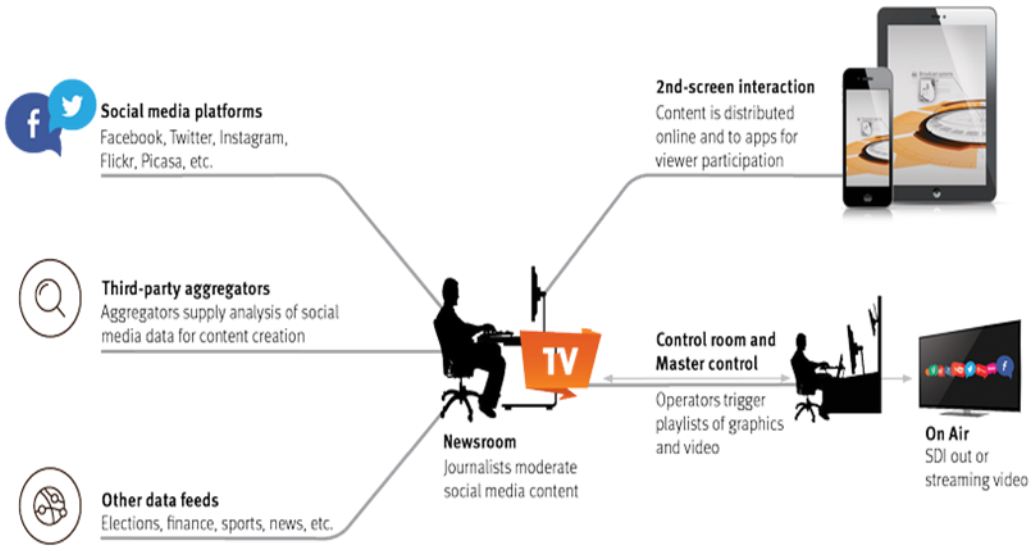

Figure 2. Social television solution from http://www.vizrt.com/solutions/social-tv-solution.

2.1 Social Television

The degree ubiquity of online services has shifted attention of people from traditional television broadcasting to online video broadcasting or streaming. For example; Flickr, and YouTube has become major media of choice for families across the globe for media consumption. [2.]

Social television in the context of this thesis is a cognitive reflection into creative partnerships of video hosting. [2.] An internet-based application uses the combination of video on demand services, live streaming services, visual marketing, and video hosting. The idea is to generate traffic for creators and advertisers through subscription services and followership for prospective contributors. The application allows users cross interaction from creator to subscriber, creator to follower and subscriber to subscriber. Creators have their individual channels which allow them to accumulate followership and interact with their followers. This makes it possible to get instant feedback to improve their products.

2.1.1 Interconnected Network of Multipurpose Application

The Internet today is eminently generative. This is as a result of its ability, range of capacity, ease of exploration, diverse tasks adaptation, hash algorithms, global accessibility and possibility to recast its scope of uses.

One of the scenarios that leads to the establishment of artificial intelligence by one of the earliest designers of the computer “Alan Turing” is the perspective of computational creativity. Computational internet-based media adopts social media and interactive processes to engage its users in that, it allows both creator and other users to upload data to a hosting application which allows amicable interaction between host and other users. [2.]

The method of technological synergy used in this study is influenced by adaptation of several social media features such as free subscription on for example YouTube. One can watch free videos hosted by the creators and paid subscriptions like Netflix. There is also a possibility for all users to drop feedbacks and reply in terms of comments like on Facebook. [1.]

3 Internet Repositories

The lofty dispersal of broadband affinity and internet facility enhance the distribution of video content. This also appeal to online visual marketing, blogging, sharing, feedback, and video hosting. This study focuses on video sharing, feedback and video hosting.

3.1 Audiovisual Technology Repositories

Audiovisual technology repositories allow human interaction with real time generative computational systems. These range from marketing, distribution and social interaction to entertainment. User feedback is gathered to improve the services. From an anthropological perspective adopted by social science and media studies critics, computers are seen as an artefact in a social context. McLuhan famously described all media as extensions of human capacities (McLuhan 1964). This kind of humanistic approach to computer usage is echoed in the works of Agre (1997) from an AI perspective, Hickman (1990) from the point of view of Dewey’s pragmatism, and Clancey (1997) drawing insights from the evolutionary psychology of Brunswick and Gibson. [2.]

3.2 Security of Video Streaming

Audiovisual technology repositories has resulted into an innovation in production, dissemination, preservation, and accessibility to video streams. However, the synchronization between audio and visuals is confirmed through an algorithm that mound visuals according to the analysis of the video and audio.

The functionality of Internet based applications such as video streaming and internet protocol television (IPTV) depends on many factors such as security and reliability [3, 4]. For example, the privacy of RFID authentication, micropayment systems, one-time passwords and many data origin authentication applications must be carefully considered. Hash chains ensure a quick secure method for real time applications which are highly responsive to any linger caused by the security overhead. [3.]

In video streaming, the measure of security varies in proportion to the video requirements. Video states and the network shapes are sometimes combined with hashing and watermarking for security. Digital Rights Management (DRM) was made to prevent illegal accessing, copying or converting of multimedia tools into other patterns by adopting digital mechanism. Cryptographic Signature is another security measure of hashtag that ensure video streaming security, it is used for validation aims such as the discovery of any modification or change in the signed data and to approve the sender of data. [3.]

4 Technological Synergy and Digital Video Broadcasting

The potential and what can be achieved by streaming and broadcasting through social media is enormous. Broadcasters and entertainers now explore the power of social media to build their platforms, especially through video streaming. This enables close relationship with their audiences and receive instant feedback to help them improve their productivity and products. [4.]

4.1 Digital Video Broadcasting (DVB)

DVB is a standard set to define digital broadcasting of videos via the usage of satellite, cable and terrestrial broadcaster. It is a digital television standard defined by EBU (European Broadcasting Union), these utilities can be found in Europe, North and South America, Africa, Asia, and Australia, it validates that with all set-top box (STB) or set-top unit (STU), other receivers can receive content and display it on display devices. The standard it uses is that of DVB-S, DVB-S2 and DVB-SH, for cable mode of distribution, for terrestrial distribution is DVB-T, DVB-T2 and for digital terrestrial television, it is DVB-H, DVB-SH. [5.]

4.2 Encoding and Decoding of Video

The compression of video is called encoding. A video object comprises of one or more layers to back scalable coding. This scalable pattern permits the re-structure of video in form of standout base layer and the addition of improved layers. This permit applications to set-up a single video bitstream for an array of bandwidth elaboration conditions. In this thesis, emphasis will be on the types of video object layers standards, MPEG-4 and its functionality of video coding standard. [6, 7.]

4.3 Protocols and Standards of Video Streaming

As classified in ISO/IEC 14496-2, the visual standard of MPEG4 has designed by Moving Picture Experts Group (MPEG) is to allow the same platform for broad magnitude of multimedia applications. Although, video compression standards such as MPEG-1 and MPEG-2 were utilized in early stage of multimedia publishing, such as video CD and DVD. Nowadays MPEG-2 is still in utilization but more or less in broadcasting industry

as in distribution technology. MPEG-1 or 2 are not suitable technologies for streaming. [6.]

Typically, video processing and streaming requires a carefully orchestrated plans and design that will make the workflow smooth and make production comes out great. The planning always begins with a creative idea which is scripted, then proceed to production, post-production and then meeting the end users' need according to the intended purpose of the production. [7.] Figure 3 shows the kind of functions that MPEG-4 offers for video standard.

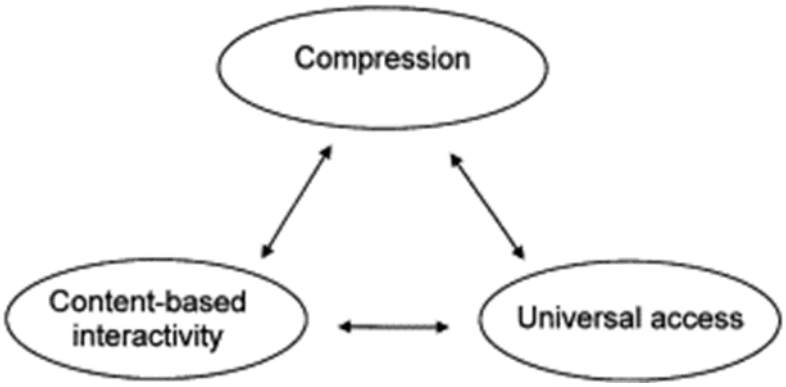

Figure 3. Functionalities offered by the MPEG-4 visual standard [6].

4.4 Features of MPEG-4 video coding standard

The trending of high definition TV are making higher coding efficiency of great demands. Video coding for telecommunication applications has undergone the evolution of advancement. Video coding standard MPEG-4 deals with diversification of network types and loss/error robustness requirements. [12.] The features of MPEG-4 can be sub-group into three as they appear in the below explanatory summary.

1) Compression Efficiency: An upgrade coding efficiency and coding of diverse synchronous data streams will increase integration of applications based on the MPEG-4 standard. What makes MPEG4 most useful and agile video encoding standard is that, the visual standard is optimized for three bitrate ranges. These are:

   (i) Below 64 Kbit/sec

(ii) 64 - 384 Kbit/sec

(iii) 384- 4 Mbit/sec

MPEG-4 gives support for both interlaced and progressive material. The chrominance format that is supported is 4:2:0. In this format the number of Cb and Cr samples are half the number of samples of the luminance samples in both horizontal and vertical orientation. Each component can be represented by a number of bits ranging from 4 to 12 bits. [6.]

2) Content-Based Interactivity: One of the most essential innovation that MPEG-4 provided is coding and representing video objects relatively to video frames enable content-based applications. Based on efficient representation of objects, object manipulation, bit stream editing, and object-based scalability allow new levels of content interactivity. [6.]

3) Universal access: MPEG-4 encoded content can be operative at broad range of media like mobile networks, wireless and wired connections or any available bandwidth. [6.] MPEG-4 is currently the best possible compression technology available now because it has the best quality and quantity algorithm. Several of the properties of MPEG-1, MPEG-2 and other related standards are embedded in MPEG-4 with new features such as Virtual Reality Modeling Language (VRML) support for 3D rendering, object-oriented composite files which includes audio, video and VRML objects, and other forms of interactivity. [6.]

5 Transport Network

Transport Network (TS or MPEG-TS) is a protocol used in transmission of audio, video and data communications. It permits multiplexing of digital audio and video, that is; the combination of data is the transmission of a bit stream occurring at the same time for transmission over a variety of standard mediums such as DSL, IP, IPv, Ethernet, Cable TV networks, and more, which is made to assigned only the delivery. The standard for transmission of audio, video, program and system information Protocol (PSIP) data is

known as MPEG transport stream. It is used in broadcast systems such as DVB, ATSC and IPTV. [7.]

5.1 Video Streaming'

The process by which data from a video file is steadily disseminated through the Internet to a remote user is known as video streaming. There is no need for users to download video on their computer system before viewing. It is different form DVB in that digital video broadcasting (DVB) is a standard set to rely on already available satellite, cable, and terrestrial infrastructures to make video files available for users. [8.]

Video streaming could be practically affected by or relies on compressed video stream because transmission of raw video streams is impractical. Computer processing and the limitation of memory could also inflict serious restriction on transmission rates. [8.]

A lot of video compression standards have been released by technical organizations and industrial corporations for the last couple of decades. Each social platform might have a unique standard that is in application to make live video stream possible over the internet, this make simultaneous live video stream of social media difficult because the social app that is capable of doing this is rare and uncommon and they must follow compatibility and support standards. [5, 7.]

5.2 Video Compression Standards (SD, HD and 4K.)

Figure 4. Video compression standards.

5.2.1 SD

SD is the abbreviation for ‘Standard Definition’. This is a standard quality of movies and other videos which has resolution measures with vertical resolution of lines. The resolution of SD in South and North America including some other countries like Japan is 480i which also is referred to as 480p but the resolution In Europe, Africa, Australia and most of Asia is 576i. When SD videos are watched on a big screen such as TV or bigger computer screen they appear as lower quality videos but not bad when watched on smaller screen like smartphones or tablet. [5, 7.] Figure 4 is the diagram representation of video compression standard from SD to 4K.

5.2.2 HD

HD is a well-known quality or screen resolution in videos production in the present days, it has better quality than SD and is well preferred in the modern television production. HD in movies today is the most frequently known quality or screen resolution. HD in full pronunciation is “High Definition”, it is the resolution of HD videos. It is extremely superior to SD videos in terms of resolution and quality. HD videos are larger file size that require prolonged loading times when watching or streaming via internet, a lot of latest television and video playing accessories are “HD-ready” that supports movies produced in HD. Typically, 720p and 1080p are the resolution of HD. 1080p can also be called ‘full HD’. [6, 7.]

5.2.3 4K

In order to improve quality and flexible production delivery, 4K has become popular with the filmmakers nowadays. The resolution of 4K is 2160p but it has two standard that differentiate them. [6, 7.] These are:

(i) DCI is the standard used in cinemas and filming movies. This has 4096 x 2160 pixel as resolution.

(ii) UHD-1 (or ultra-high-definition) is a standard for televisions, computers and video games. It has resolution of 3840 x 2160 pixel. [6, 7.]

6 Delivery of Television Broadcasts

The type of networks used to transmit television signal to the viewer is refers to as broadcasting. The following listed mode are usually the provider of television feeds. [8.]

6.1 Analogue Terrestrial Broadcast

This is the method used from the invention of broadcasting to broadcast television signal. By radio waves the signal is sent from a national network of masts antenna, the viewers then receive through an aerial. However, moving towards digital television broadcasting countries globally are in the processes dropping the use of traditional analogue terrestrial television broadcasting. [8.]

6.2 Digital Terrestrial Broadcast

This is also transmitted via radio frequency, but it is different from standard analogue television in that it uses multiplex transmitter that give way for the use of multiple channel. The signal is received by the viewer through set-top box or a receiving device able to decode signal received by standard aerial antenna. [8.] Figure 5 illustrates the delivery of television broadcast based on digital terrestrial transmission.

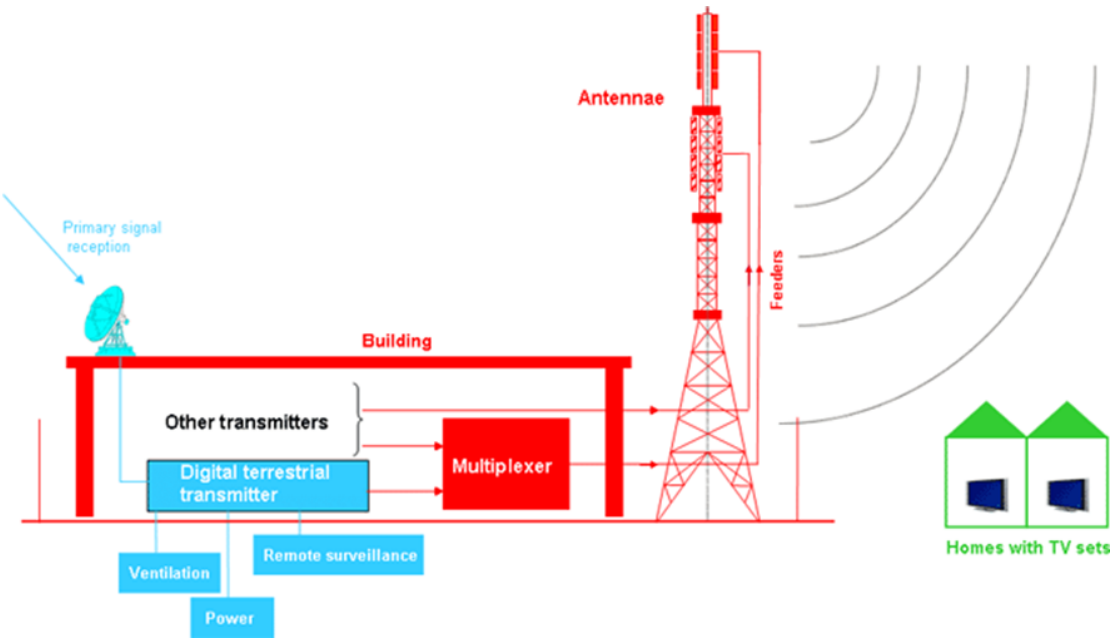

Figure 5. Delivery of television broadcasts from www.arcep.fr.

6.3 Satellite Broadcast (Direct-To-Home)

Through communications satellites, satellite broadcast is delivered to the viewer. Via satellite dish the signal is received. This is able to provide a broad range of channels and services in several areas across the globe, most especially the areas covered by cable or terrestrial providers. [8.]

6.4 Cable Broadcast

This is system of delivery for broadcast of a television programme that serves paying subscribers. It can also be used to provide internet with high speed and telephone services.

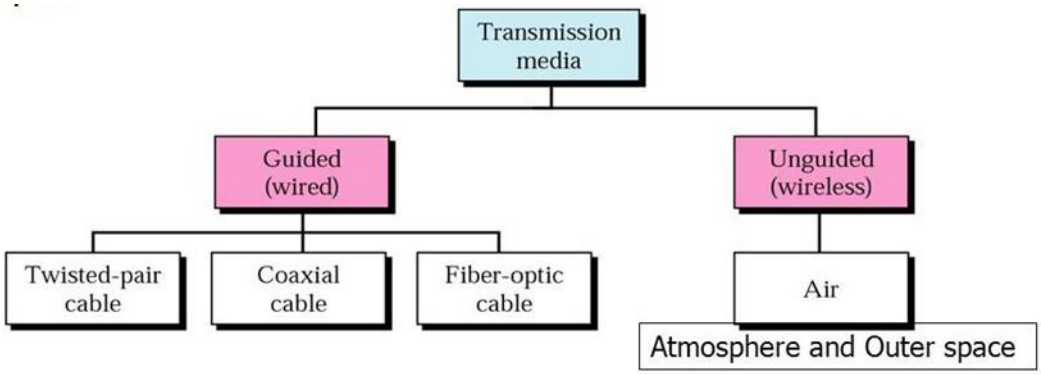

Figure 6. Categories of cable television by transmission media

As shown in figure 6 above, several of the cable television services transmit radio frequency signals in the bands of very high frequency (VHF) and Ultra High Frequency (UHF). The cable television services implore the usage of coaxial cable earlier and later turned to optical fiber because of its practicality. Now the usage of various forms of wireless channels are in use.

7 Television Transmission Technology

The past 5 years to 10 years has witnessed evolution and acceleration of the impact of web in audio and visual distribution across the web via social media which has created huge opportunity but at the same time it is also a major challenge to traditional television

distribution. Social media platforms like YouTube, Facebook, Twitter and Periscope has set the standard high for video content distribution and viewers engagement which pose a threat to traditional television distribution.

7.1 Comparison of Traditional Television to Social Television

An easily reached conclusion about the comparison of traditional television to social television is their mode and platform of contents distribution. Although a lot of investment is expected to be done in other to build a functional distribution enabled traditional television channel, and so also are some background works also expected to be done to build an effective social contents distribution platform. [7.] Figure 8 shows the internal mobile truck studio used in the coverages of horse race at Vermo Leppävaara, Espoo in the year 2017, the studio was said to be wirelessly connected to Yle television station at Turku as at the time when the picture was taken.

As each day dawn, the emphatic point in this current age is that traditional television can use social media to enhance their productivity and add more values to their customer base. It should also be noted that social media are the end result of technology functionality, traditional event remains traditional rarely, there is also possibility that international event can locally be interpreted, contents creation and distribution depend solely on technology. All these points further prove why the two are inseparable for serious business minded distributor. [9.]

One of the questions in the survey that was asked in the course of this project was; “do you think that social television channel can replace conventional television or traditional television station channels?” What was gathered from numerous response and reply to the survey is that traditional television will always remain relevant as long as the older generation are still alive but this however is not a solid ground to establish the survival of traditional television distribution because this will reduce viewership as the younger generation tends to get glued to their portable and mobile devices which are mostly powered by social content distribution. However, if the two mode of content distribution combine forces, the result will be highly beneficial.

To fully understand the market and the competition between traditional television and social media content distribution, many factors has to be examined such as region, country and the competitiveness of the market, one of the response to the survey to the thesis

revealed a strong argument that unreliable internet provision makes social media content of audio and visual streaming replacing traditional content distribution unlikely at the moment in Africa despite the fact that everyone has access to social media, the internet connections are unreliable for streaming. [9.]

7.2 Traditional TV and Web Television Production.

Television distribution platforms are serving different users. Social television programmes can ensure personal connections and reach specific viewers. More so, social television's users can leave instant comments, this could be treated as an instant feedback to the host. Meanwhile, traditional television may not reach the audience on time. [10.] Figure 8 shows the internal mobile truck studio used in the coverages of horse race at Vermo Leppävaara, Espoo in the year 2017, the studio was said to be wirelessly connected to Yle television station at Turku as at the time when the picture was taken.

Figure 8. Live streaming at Vermo Leppävaara, Espoo Horse race 2017.

Television broadcasting's influence and role has broadened among African urban dwellers. Although it comes with a great deal of challenges, among which are unstable electricity, high cost of subscription to cable television distribution, and weak coverages.

These reasons have paved way for independent broadcasting distributor to succeed because the urban dwellers know that their package will come with quality and class without political influence and prejudice. [10.]

More so, the policies and the cost involved in the establishment of independent television distribution are enormous, this mean that social television will thrive because an average African now have access to mobile technology and internet bandwidth by their mobile providers. [11.]

8 Streaming Media and Bandwidth in Africa

More than ever before, the voices of the continent of Africa cannot be easily ignored because social media has created undisputed development in social cycle with social media bringing African voices to the fore, linking the process of globalization to the local conditions of their respective countries of origin.

The access to better social technology allows the diaspora to make outstanding and efficient contribution to their individual nation's building thereby; cementing the transnational society. Despite the fact that issues of internet connection and unreliable bandwidth may make video streaming a lot more difficult for the African urban dwellers, there is possibility that a production company can build viewership through the African in diaspora via social media, this will have a lot of influence in preparing the indigenous ready to welcome the cable stream version of what began via social media, because the aftermath of the technological reliability on internet and other streaming facility will force content distributing media publishers targeting Africa as the major viewers to evolve into method of distribution that is best to serve the indigenous viewers as well because of their competition is with incumbent broadcasters that are distributing via cable and satellite television providers, and these will expands the scope of the services.

The key is to reach and serve the Africans in diaspora first via social media distribution, the popularity will undoubtedly spread to the Africa indigenous dwellers. The perfect example is the Sahara reporters' television, the social television distribution platform situated in the United State Of America are gaining ground and fame very fast addressing

the issues relating to Africa through social media and now gaining the attention of both international and the urban investors.

8.1 Challenges of Video Stream over Wireless Network

Wireless communication is typically transmission of data over wireless technology medium such as WiFi or mobile data (3G/4G). Video streaming over wireless networks has gained acute admiration and attention by several applications and many other systems are being adapted to this fascinating tool, a wireless local area network (WLAN) has capability of connecting many audiovisual entertainment devices in a home. [12.]

Streaming technologies can vary from User Datagram Protocol (UDP) to Real Time Streaming Protocol (RTSP) and most popular Real-Time Messaging Protocol (RTMP). Where User Datagram Protocol (UDP) is more or less point-to-point due to how this technology was build, RTSP offers more secure transmission for streaming content. Still most platforms prefer that stream should be generated as RTMP which is developed by Adobe. [12.]

In order for video streaming to be efficient for users, the flow and delivery of services must meet the deadline. However, due to struggles of network nodes and fitful conflict from external radio origins such as microwave ovens or wireless telephones, the full efficiency cannot be guaranteed. There is irregularity in link capacities and transmission error rate which affects systems to deliver the best end-to-end performance, dependable transport and video coding. [12.]

The problem facing video streaming diverse by rate of increase complexity of network, this part of this thesis is about multi-access channel among multiple video streams and multiple streams sharing a mesh network. Transmission of video should be able to match the quality of the wireless link on which the transmission is based. [12.]

8.1.1 A Single Wireless Link Stream

The standard of wireless link differs for each video quality transmission, which has to be adapted accordingly. The variation of rate of video can also be accomplished through the alteration between multiple bit streams encoded at various rates or by bit streams truncate from a scalable encoded depiction. The packets can also be intelligently

dropped according to their corresponding relevance and exigency through appropriate rate-distortion developed framework assigned. [12.]

Video streaming at one established quality level using transmission control protocol (TCP) varies based on TCP congestion control for delivery of transmitted video packets, before previous packets are acknowledged there is delay in playout deadline for the upcoming transmission. [12.]

8.1.2 Single Hop Network Streaming

The synopsis of multiple video streams sharing per time one network over single-hop wireless connections with capability of different speeds link. When all the visual streams starts from the same wireless node the boost can be done collectively by a central controller. For example, this may be a problem in wireless home networks where video might be concurrently streamed from a DVD player, a self-video recorder and a laptop computer to another displays around the house. [12.]

8.1.3 Mesh Network Streaming

Video streaming over wireless mesh networks obtrude extra objections made known by multi-hop transmissions. Cross-layer scheme and surge for this issue is a very effective area of inspection with several linger open problems. Routing over wireless mesh networks is a difficult problem due to dynamic link qualities, even when nodes are static. [12.]

9 Bandwidth in Africa

In Nigeria among many other African countries for example, closer to about 6,000 people share a cellphone tower on average. As a result of this congestion even if there is availability of 3G networks, the experience can be very slow. The rate of cellphone tower is not as vast as that of data consumption per person. [13.]

According to the published Hamilton Research of the annual edition of the Africa Telecom Transmission Map, Africa's international Internet bandwidth reached the 3 Tbps

mark in December 2014 and by December 2016, the inbound summation of Africa's international Internet bandwidth reached 5.825 Tbps which is a 65% growth compared to 150 Gbps in 2015. [14.]

In 2016, 15 African countries saw annual growth of over 50%, and five saw growths of 100%. There is a lot of possibilities for future growth. There is 3.065 Tbps that is still a fraction of the total design capacity of at least 94.4 Tbps that is potentially now available on the 19 submarine cables serving the region in December 2016. This total design capacity has increased from 70.4 Tbps in 2015, 60.3 Tbps in 2014, and 27.1 Tbps in 2013. [14.] Figure 7 below shows the rate of the increase in Africa international internet bandwidth over the period of ten years from the year 2007, the chat is reveals that social television users experience in Africa will keep on thriving.

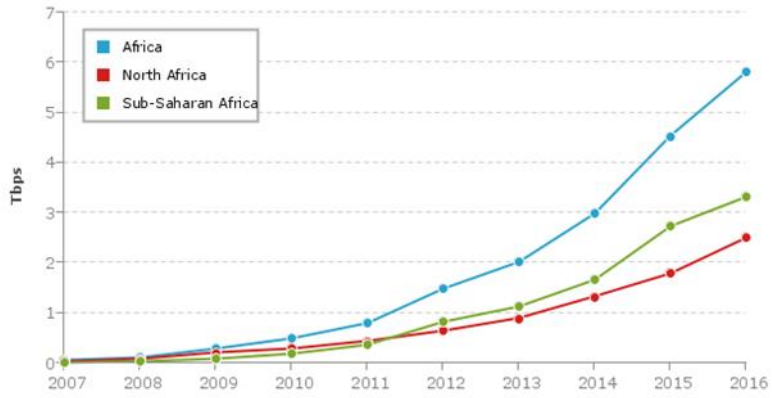

Figure 7. Chart: Africa International Internet Bandwidth, 2007 - 2016

10 Hypothesis of tvRay Africa

The idea of social television is the latest evolution of interactive TV. This thesis is as a result of the hypotheses that television's experience can be made more participatory and innovative. During the course of this thesis, several experiments were carried out and these experiments included live streaming of pre-recorded videos of a concert and an home studio's show live streamed on multiple social media like Facebook, periscope, YouTube and Instagram.

The tvRay Africa hypothesis proposed simultaneous live stream of video on multiple social media platforms using applications that allow simultaneous live streaming across multiple social media via multi-camera and professional sound production with unique and creative contents to build a customer base for the social media start-up company like tvRay Africa.

To the contrary, vMix and OBS which were the streaming applications used for the test, does not allow simultaneous live video streaming on Facebook, Twitter, Instagram and IRC social media at the same time without using other essential tools needed to make this possible.

Research shows that simultaneous live streaming on all social platform at a time with the usage of these applications is only possible with the usage of added right tools. However, using vMix application only, there was a possibility to reveal viewers' live response or comments from each social media that is compatible with the application during the live streams and the goal of the experiment which was to test how viewers engage tvRay Africa's social media page was achieved.

Based on tvRay Africa user's experience and feedback, it was discovered that in media streaming, production qualities matter rather than quantities and with the usage of application like vMix which also supports large input range up to 4K camera resolution, professional production is possible. The core idea behind social TV online is to make television experience a more active experience for audiences, rather than the passive viewing experience it was before now.

11 Conclusion and discussion

The potential of what can be achieved by streaming and broadcasting through social media now is enormous. Broadcasters and entertainers explore the power of social media to build their platform, especially through live streaming and broadcasting. This helps to build a close relationship with their audience and receive instant feedback to help them

improve their productivity and products. Eventually, this will determine the rate of the growth of the company or the brand.

The impact of web in audio and visual distribution across the web via social media has created both opportunities and challenges. For example, the issues of internet connection and unreliable bandwidth may make video streaming a lot more difficult for the urban Africans.

The functionality and efficiency of internet repositories is not really reliable in Africa currently because successful internet repositories services require a lofty dispersal of broadband affinity and internet facility that enhance the distribution of video content.

However, in 2016, according to the published Hamilton Research of the annual edition of the Africa Telecom Transmission Map, Africa's international Internet bandwidth keeps growing. About 15 African countries saw annual growth of over 50%, and five saw growths of 100%. This has paved way for greater possibility of new media and cross-media broadcasting innovation.

Finally, different kinds of other more ambitious test and experimental platforms are being explored by tvRay Africa. Social TV appears to be the best solution for Ray Africa start up, because the tools are not too expensive. With good shows that catch the attention of people, the social TV will go viral with time.

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Details of the references are given here. Use the referencing system required in your degree programme or as agreed with your supervisor.

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Testing Social Television Live Stream

The approach used for this thesis project were all practical, virtual and testing. Two audio/visual production were done and these include; a mini home studio production of a show called breaking borders and a live musical concert titled moment of bliss, the event that took place at pop and jazz konservatorio Arabiankatu 2, Helsinki in collaboration with Christian Accord International, at the event there were over ten planning and working crew volunteers with over fifty audience in attendance. The events were designed for OBS and vMix applications' testing. After the live stream tests were done. A questionnaire was filled by the volunteering viewers.

The survey contains questions about social TV testing as social television channels via multiple social media like Twitter, Facebook, Instagram and YouTube by tvRay Africa. The aim is to gather Intel from viewers for the purpose of the thesis and the applications' functionality and streaming efficiency. .

QUESTIONNAIRE GUIDE

(i) Which country did you stream from?

(ii) Which social media did you stream from? Please, stream from at least two social media. (a)Twitter (b)Facebook (c)Instagram (d)YouTube

(iii) Will you like to watch our streams again?

(iv) Rate the stream from 1 to 5 on the social media that you streamed from.

(v) Rate the production.

(vi) Do you think that social television channel can replace conventional television or traditional television channels? Yes ( ) No ( ) Why?

(vii) I understand that this survey will be used for academy and research purposes. Yes ( )

Hypotheses tested:

(1) The possibility of making social media platform replace conventional or traditional television channels.

(2) The possibility that social television stream can enhance productivity, engagement of people and bring more profitability assistance to the conventional or traditional television channels. 3) The possibility that a startup television broadcasting company can start broadcasting channel on low budget.

Video Hosting, Streams and Data Base

During the course of this thesis project, a lot of experiments were carried out and many hypotheses were tested over a period of time. During the hunt for live streaming application which will be suitable for the delivery of live videos on facebook at tvRay Africa, free version of OBS and vMix video streaming applications were tested. Many viewers were articulated over a period of time while the number of the page likes increases, although the goal of this experiment is to start a cable television stations, It was discovered that it is easier to build viewership and gain more station popularity via social media before considering reaching the cable TV consumers.

In other to prevent re-broadcasting of the same video there is a need for an application which can allow simultaneous live streaming over multiple social media like Twitter, Facebook, Instagram and other social media, so as to widen the possibility of getting wider potential customers and viewers, it is a known fact that the highest visit rates in social networking is huge and with a little effort, contents can reach vast number of potential customers and users. However, the research shows that the application which may be capable of simultaneous streaming at the same time is limited and very expensive for a social TV.